

YEAR 1893

Twelve storms were found to have occurred in 1893. Tracks for these storms are presented in Fig. 3.

Storm 1, 1893 (Jun. 12-20), H.

The following information was found in relation to this storm:

1) This storm appeared over the eastern Gulf of Mexico the morning of Jun. 15 and by the evening report of that date had advanced to a position near Jacksonville, Fl., with heavy rain and gales along the South Atlantic coast. During Jun. 16 the storm moved slowly N.E. along the coast, with pressure falling below 29.60 inches. The rain area extended to the south New England States, heavy rain fell along the Carolina coast and N.E. gales prevailed along the middle Atlantic and the New England coasts. During Jun. 18 the storm passed N.E. beyond the region of observation. But late reports indicated that by the evening of Jun. 19 the storm center had advanced to S. of Newfoundland with central pressure about 29.50 inches and gales of force 10 over the Grand Banks. During Jun. 20-21, the center of disturbance remained nearly stationary S.E. of Newfoundland, with pressure 29.20 to 29.30 inches and gales of force 9 to 11. Reports of Jun. 25 showed a S.E. motion to the Azores and on Jun. 26 the storm had passed to a position N. of the Azores with pressure about 29.30 inches and gales of force 7 to 9, after which it disappeared N. of the British Isles during Jun. 27 (Monthly Weather Review, Jun. 1893). 2) Some maximum wind velocities were: Tampa, S.W. 37 mph on Jun. 15; Jupiter, S.W. 30 mph on Jun. 15; Jacksonville, S.W. 44 mph on Jun. 15; Charleston, E. 54 mph on Jun. 16; Wilmington, S.E. 36 mph on Jun. 16; Southport, S. 54 mph on Jun. 16; Kittyhawk, N.W. 40 mph on Jun. 17; Hatteras, W. 42 mph on Jun. 17; Norfolk, N.W. 32 mph on Jun. 17; Atlantic City, N.E. 36 mph on Jun. 17; Woods Hole, N.E. 35 mph on Jun. 18 (Monthly Weather Review, Jun. 1893). 3) Storm track as follows: Jun. 15, lat. 28.3 N., long. 86 W.; Jun. 16, lat. 33 N., long. 79 W.; Jun. 17, lat. 37.3 N., long. 71.5 W.; Jun. 18, lat. 38.7 N., long. 69 W.; Jun. 19, lat. 43.5 N., long. 58.5 W. (Monthly Weather Review, Jun. 1893). 4) Washington, Jun. 16, 8 P.M. The storm has moved N.E. off the South Atlantic coast, attended by heavy rain and gales from Virginia to Florida (The New York Times, Jun. 17, 1893, p.12, col.2). 5) Atlantic City, N.J., Jun. 17. Ties from the bed of the electric road on Bergantine Beach and portions of a modern house are among the wreckages dashed upon the bulk head of this island. It tells of savage work by the storm of early this morning but the extent of damage to Bergantine is not known as it is impossible to get a boat across the inlet owing to the heavy sea and telephone connection with the place is broken (The New York Times, Jun. 18, 1893, p.5, col.3). 6) Washington, Jun. 18, 8 P.M. The Atlantic coast storm has disappeared E. of the region of observations (The New York Times, Jun. 19, 1893, p.12, col.2). 7) Storm of Jun. 15, 1893. N.W. Fl. Minimal. High tides N. of Tampa Bay (Dunn and Miller, 1960). 8) Storm of Jun. 12-30, 1893. Bay of Campeche, Atlantic coast (Tannehill, 1938). 9) A storm was first observed at lat. 20 N., long. 95 W. on Jun. 12, 1893 and, after

lasting 18 days, it was last observed near lat. 63 N., long. 7 E. (Mitchell, 1924). Author's note: The track which is also included in Mitchell (1924) extends much farther east than the one in Neumann et al. (1993); however, both tracks are very similar from the southwestern Gulf of Mexico to south of Newfoundland.

Information in the above items was found to support, in general, the track for Storm 1, 1893 which is displayed in Neumann et al. (1993). Therefore, such a track is reproduced in Fig. 3.

Although no winds on hurricane force were mentioned in the items above, the author of this study decided to keep the hurricane status given to this storm in Neumann et al. (1993).

Storm 2, 1893 (Jul. 4-6), H.

Very little information was found in relation to this storm: 1) A destructive cyclone visited the Bay Islands, off the coast of Honduras, Jul. 6, wrecking a number of vessels and causing great loss of life and property (Monthly Weather Review, Jul. 1893). 2) Storm of Jul. 4-6, 1893. Western Caribbean Sea (Tannehill, 1938). 3) A storm was first observed at lat. 11 N., long. 79 W. on Jul. 4, 1893 and lasted 2 days; it was last observed at lat. 17 N., long. 86 W. (Mitchell, 1924).

Information in the items above was found to support the track for Storm 2, 1893 which is displayed in Neumann et al. (1993). Therefore, this track was kept unchanged and reproduced in Fig. 3.

The amount of destruction mentioned in item 1) seems to support hurricane intensity as indicated in Neumann et al. (1993).

Storm 3, 1893 (Aug. 13-25), H.

The following information was found about this storm: 1) Late reports trace this hurricane to near Martinique on Aug. 15 (Monthly Weather Review, Aug. 1893). 2) As soon as the first dispatch was received from St. Thomas, a special bulletin, dated 3:30 P.M. Aug. 16, announced that a West India hurricane was moving westward and was about to cross the 65 degrees W. meridian (Monthly Weather Review, Aug. 1893). 3) A storm passed St. Croix at 2 P.M. Aug. 16. The vortex entered Puerto Rico from the S.E. and passed between Patillas and Maunabo between 7 and 8 P.M. Aug. 16. It emerged from Puerto Rico to the Atlantic waters, probably between Isabela and Quebradillas, about 3 A.M. Aug. 17. At the Observatorio of Obras Publicas (Observatory of Public Works), San Juan, the barometer dropped from 29.60 inches at 4 P.M. to 29.37 inches at 7:15 P.M. and then to 29.17 inches at 8 P.M., and then rose to 29.41 inches at 9:15 P.M. The wind shifted from N. at 8 P.M. to E. at 8:45 P.M. and blew at a rate of about 55 mph before the anemometer was carried away. At midnight Aug 16-17, the barometer dropped to 29.33 inches at Sultana del Oeste (Mayaguez) and the wind blew there at a rate of 50 mph at 3:30 A.M. Aug. 17 (Salivia, 1972). Author's note: This storm is known in Puerto Rico as the one of San Roque. 4) On the morning of Aug. 18 there were some indications at the South Atlantic stations of the presence of the storm center, although it was then 500 or 600 miles distant (Monthly Weather Review, Aug. 1893). 5) Washington, Aug. 18, 8 P.M.. Reports from

the West Indies indicate a center of depression N. of Haiti (The New York Times, Aug. 19, 1893, p.5, col.3). 6) On Aug. 19 indications of its approached still demonstrated its very considerable distance N.E. of Nassau and the 8 P.M. Aug. 19 forecast indicated a central position near 30 degrees N., 72 degrees W., having reached the point of recurvature northward (Monthly Weather Review, Aug. 1893). Author's note: During Aug. 19 the storm was closer to Nassau than indicated in this item. 7) Washington, Aug. 20, 8 P.M. A hurricane is apparently central about lat. 34 N, long. 75' W., moving N. The hurricane center will probably move N.E. by Monday night (Aug. 21) after touching the North Carolina coast and cross lat. 40 N. on Tuesday (The New York Times, Aug. 21, 1893, p.5, col.7). 8) Washington, Aug. 21, 8 P.M. The hurricane center has moved N.N.E. to the Bay of Fundy. N.E. gales and heavy rains have prevailed from Cape Hatteras to Cape Cod (The New York Times, Aug. 22, 1893, p.2, col.6). Maximum winds at various stations were as follows: Key West, N.W. 35 mph on Aug. 20; Jupiter, W. 38 mph on Aug. 20; Block Island N.E. 72 mph on Aug 21; Woods Hole, N. 60 mph on Aug. 21; Nantucket, N.E. 52 mph on Aug. 21; Eastport, N.E. 46 mph on Aug. 21 (Monthly Weather Review, Aug. 1893). 10) The liner "Noerland" ran into a cyclone Aug. 21 which, according to the officers, was one of the most terrific force. It was encountered at lat. 41 N., long. 65 W. and lasted 6 hours. The vessel did wild tossing and rolling during that time, but sustained no injury (The New York Times, Aug. 24, 1893, p.5, col.5). 11) The steamship "Andirondak", from Haitian ports, arrived (at New York) one day late. Furious gales and head seas delayed her progress (The New York Times, Aug. 24, 1893, p.5, col.5). Author's note: The above information could be related either to this storm or to Storm 4, 1893 or to both of them. 12) Storm of Aug. 13-26, 1893. Windward Islands, Puerto Rico, Atlantic (Tannehill, 1938). 13) Storm track showing the following morning positions: Aug. 17, lat. 19 N., long. 69 W.; Aug. 18, lat. 23 N., long. 72 W.; Aug. 19, lat. 27.5 N., long. 73 W.; Aug. 20, lat. 32 N., long. 75 W.; Aug. 21, lat. 38.5 N., long. 72.5 W.; Aug. 22, lat. 47.7 N., long. 59.7 W.; Aug. 23, lat. 50.7 N., long. 40.7 W. (Monthly Weather Review, Aug. 1893). 14) An Aug. 1893 storm appeared at lat. 15 N., long. 66 W., recurved at lat. 30 N., long. 75 W. and disappeared N.E. of Newfoundland. Track for this storm starting near lat. 15 N., long. 59 W. on Aug. 15, then crossing over Puerto Rico, Turk Is. and Caicos and remaining off the U.S. coast (Garriott, 1900). Author's note: The appearance of the storm near lat. 15 N., long. 66 W. as listed by Garriott (1900) is obviously incorrect. 15) A storm was first observed at lat. 9 N., long. 51 W. on Aug. 13, 1893 and lasted 13 days; it recurved at lat. 29 N., long. 76 W. and it was last observed at lat. 45 N., long. 36 W. (Mitchell, 1924). Author's note: For the period Aug. 13-23, a track in Mitchell (1924) and the one in Neumann et al. (1993) are very similar.

The track for Storm 3, 1893 which is shown in Neumann et al. (1993) was slightly adjusted a few miles to the south during the afternoon and evening of Aug. 16 and during most of Aug. 17, resulting in a new 7 A.M. Aug. 17 position which the author estimated near 19.0 degrees N., 68.0 degrees W., based on space-time continuity and on information about the storm at St. Croix and

Puerto Rico contained in item 3). 7 A.M positions in Neumann et al. (1993) for the period Aug. 13-16 and after Aug. 17 were kept unchanged. The track which was prepared by the author of this study is displayed in Fig. 3.

Although, strictly speaking, no hurricane winds were mentioned in the items above, the author of this study decided to keep the hurricane status given to Storm 3, 1893 in Neumann et al. (1993). His decision was based on the pressure of 29.17 inches reported at San Juan, Puerto Rico, when the storm passed to the S. of that city in the evening of Aug. 16 (item 3), on the wind maximum of 72 mph reported at Block Island on Aug. 21 (item 9), being only two miles below hurricane force, and on the word hurricane which was used in several of the items above.

Storm 4, 1893 (Aug. 15-26), H.

The following information was found about this storm: 1) The storm that was felt at Cape Hatteras the morning of Aug. 23 is now known to have come from lat. 23 N., long. 64 W. on Aug. 20 and lat. 14 N., long. 42 W. on Aug. 16 as a well-defined hurricane that advanced over the mid-ocean without being recognized as such at the West Indian stations. Therefore, its remarkable growth and track until it reached New York were not well foreseen and were at once checked by the overpowering influence of the land. The path of the center appears to have been northward passing within less than 100 miles of Cape Hatteras and then quite exactly over Atlantic City and New York, at which latter place it was central in the morning of Aug. 24 (Monthly Weather Review, Aug. 1893). 2) Washington, Aug. 23, 8 P.M. A storm center has developed off the South Atlantic coast and has moved to a point to the E. of the Maryland shore. The indications are that the storm center on the Middle Atlantic coast will move N.E., keeping off the immediate coast (The New York Times, Aug. 24, 1893, p.5, col.6). 3) A special bulletin was issued at 2 P.M. Aug. 24 indicating that at last accounts the storm center had passed from the ocean on to the land and was traversing southern New England, a route that was quite unusual and that it would probably facilitate the breaking up of the storm. N.E. gales of 52 mph. occurred at Atlantic City and of 56 mph at New York, shifting suddenly to S.W. between midnight Aug. 23-24 and 6 A.M. Aug. 24 (Monthly Weather Review, Aug. 1893). 4) Maximum winds were N. 60 mph at Cape Hatteras and N.E. 70 mph at Kittyhawk, both on Aug. 23 (Monthly Weather Review, Aug. 1893). 5) After moving inland, the pressure at the center rapidly filled up and the rain and winds diminished as the storm went northward over New Hampshire and disappeared near the mouth of the St. Lawrence River on the morning of Aug. 25 (Monthly Weather Review, Aug. 1893). 6) The bark "T. Towner", which arrived in New York from St. Croix, encountered a hurricane on Aug 21 on the southern edge of the Gulf stream (The New York Times, Aug. 29, 1893, p.1, col.6). Author's note: The bark met Storm 6, 1893 three days later. 7) Bark "Glencoyne" sailed from Jamaica to Glasgow and went through the Windward Passage, having had variable winds until Aug. 22 when the barometer served notice that there was trouble ahead. At 6 P.M. the bark was pitching so heavily that it was necessary to heave to. Four hours later, the

full-blown hurricane was raging from E.. Suddenly the wind ceased and almost at a moment there was a dead calm and a glance at the barometer showed that the mercury had dropped to 28.10 inches, a fall of more than 2 inches in less than 9 hours. For 30 minutes the bark was in the vortex and then the storm raged again. The gale improved somewhat but blew hard again on Aug. 24. At 9 A.M. the bark was on her beam ends and she was in so imminent danger that the captain ordered the crew to cut away the maintopmast (The New York Times, Aug. 30, 1893, p.1, col.3). Author's note: Another gale, that one related to Storm 6, 1893, affected the bark on Aug. 28. 8) Halifax, Aug. 28. The damage of the steamer "Cyprus" proves much greater than first reported. Wednesday morning (Aug. 23) she encountered a strong E. wind which gradually veered to S.E. and culminated in the night in a fearful hurricane with tremendous seas. When about 100 miles N.E. of Hatteras an immense wall of water struck the vessel on the starboard side, carrying all the boats, wrecking the chart-house from the deck and carrying it overboard (The New York Times, Aug. 29, 1893, p.1, col.6). Author's note: The vessel attempted to reach New York but, because of a great head sea, headed for Halifax. 9) Ship "Orealla", from Calcutta in 133 days, encountered the cyclone on Aug. 23. The seas smashed her wheelhouse, washed away her side lights and carried everything movable on her decks overboard (The New York Times, Aug. 26, 1893, p.1, col.2). 10) The Transatlantic steamships "Tave" and "Columbia" encountered the cyclone but rode it out without sustaining any material damage (The New York Times, Aug. 26, 1893, p.1, col.2). 11) Coney Island, Aug. 24. John W. McKave, a resident for 50 years, said that he never saw before a storm like this one. The waves at Brighton Beach reached 600 feet inland and rose to a height of 23 feet (The New York Times, Aug. 25, 1893, p.1, col.5). 12) Greenport, N.Y., Aug. 24. Last night a hurricane from the E. struck a portion of this island. The wind was accompanied by a heavy fall of rain and one terrific clap of thunder awoke the residents of Greenport (The New York Times, Aug. 25, 1893, p.1, col.6). 13) Babylon Beach, L.I., Aug. 24. Every boat in Great South Bay was torn from its mooring and dashed upon the shore. The tide carried away many of them hundreds of feet inland (The New York Times, Aug. 25, 1893, p.1, col.6). 14) Rockaway, L.I., Aug. 24. The thrilling event of last night's great storm was the perilous position of Patrick Craig, his wife and little girl in their fragil cabin in the outer beach of Rockaway (The New York Times, Aug. 25, 1893, p.1, col.6). 15) Jersey City, N.J., Aug. 24. The storm of last night was the severest in years but, fortunately, there was no accident of any sort and the material damage, except for yachts along the shore of New York Bay, was very slight (The New York Times, Aug. 25, 1893, p.1, col.4). 16) Vessels, large and small, were driven ashore by the wind which blew with hurricane force. Men were swept overboard and drowned, and their bodies thrown on storm lashed beaches. From one vessel alone, the tug "Panther", 17 men were lost. Other 17 of the crews of schooners "Mary F. Kelly", "Chocura" and "Hincking" also perished (The New York Times, Aug. 25, 1893, p.1, col.7). 17) The center of the cyclone was over New York at 7 A.M. yesterday morning. At 8 A.M. the official barometer at the Weather Bureau was 29.28 inches and one hour before, as the

center passed overhead, it was 29.23 inches. At 7 A.M. it was raining quite hard but the storm has lost much of her intensity. While passing along this part of the coast, the storm was moving at a rate of 30 to 36 mph and yesterday afternoon was well up the Massachusetts coast, apparently bound for Nova Scotia. The storm wrecked signs and broke the windows of many stores and residences. Central Park was devastated as never before. More than 100 trees were torn up by the roots and branches were twisted off everywhere (The New York Times, Aug. 25, 1893, p.1, col.2). 18) Storm of Aug. 23-24, 1893. Minimal at Cape Hatteras, with the center remaining offshore. Minor on the coasts of New Jersey and New York. Minimal on the western sections of New England, with heavy damage at Connecticut and Rhode Island (Dunn and Miller, 1960). 19) Storm of Aug. 15- Sept. 1, 1893. Middle Atlantic coast (Tannehill, 1938). 20) Track for the storm showing the following morning locations: Aug. 21, lat. 23 N., long. 65 W.; Aug. 22, lat. 26.3 N., long. 72.3 W.; Aug. 23, lat. 32.3 N., long. 77 W.; Aug. 24, lat. 41 N., long. 74 W.; Aug. 25, lat. 50.3 N., long. 65.5 W. (Monthly Weather Review, Aug. 1893). 21) An Aug. 1893 storm appeared near 21 degrees N., 61 degrees W., recurved near 28 degrees N., 75 degrees W. and disappeared N. of Newfoundland (Garriott, 1900). Author's note: Garriott (1900) mentioned a second Aug. 1893 storm which appeared near 22 degrees N., 57 degrees W., recurved near 27 degrees N, 77 degrees W. and disappeared N.E. of Newfoundland. The recurvature positions for both tracks seem to be in error and it is believed that the second track corresponds to Storm 6, 1893. 22) A storm was first observed at lat. 14 N., long. 38 W. on Aug. 15, 1893 and lasted 18 days; it recurved at lat. 40 N., long. 74 W. and it was last observed at lat. 40 N., long. 22 W. (Mitchell, 1924). Author's note: With the exception that this track extends much farther east than the one in Neumann et al. (1993), both tracks were found to be quite similar.

The track in Neumann et al. (1993) was supported, in general, by the information contained in the above items. Therefore, the author of this study kept such a track unchanged and reproduced it in Fig. 3.

Information in a number of the items above supported the hurricane status which Neumann et al. (1993) gave to Storm 4, 1893. And on the basis of the pressure reading of 28.10 inches reported by the "Glencoyne" during the night of Aug. 22 (item 7), the tempest was indeed a major hurricane.

Storm 5, 1893 (Aug. 15-18), H.

Quite limited information was found in relation to this storm:

1) This depression first appeared on the morning chart of Aug. 17, when it was central near Cape Breton but a report from Bermuda dated at 4 P.M. Aug. 15 had shown that an Atlantic hurricane was then moving northward between that station and Halifax (Monthly Weather Review, Aug. 1893). 2) Washington, Aug. 18, 8 P.M. The pressure is low at Assiniboine and lowest nearest Cape Breton, where a cyclone exists moving N.N.E. (The New York Times, Aug. 18, 1893, p.5, col.6). 3) Washington, Aug. 18, 8 P.M. The barometer is lowest off Cape Breton (The New York Times, Aug. 19, 1893, p.5,

col.6). 4) Track of a cyclone showing morning positions as follows: Aug. 15, lat. 32.7 N., long. 60.5 W.; Aug. 16, lat. 36.7 N., long. 67 W.; Aug. 17, lat. 43 N., long. 61.5 W.; Aug. 18, lat. 49 N., long. 51.7 W. (Monthly Weather Review, Aug. '893).

Information in the above items was found to support the track for Storm 5, 1893 which is displayed in Neumann et al. (1993). Therefore, the author kept such a track unchanged and reproduced it in Fig. 3.

The hurricane status which Neumann et al. (1993) attributed to this storm was found to be supported by information in item 1).

Storm 6, 1893 (Aug. 15- Sept. 2), H.

The following information was found about this storm: 1) Marine reports for Aug. 22 show very low pressure and high winds at lat. 22 N., long. 57 W., suggesting that the hurricane was even there at a state of full development. If the approximate track of the center be traced back to lat. 18 N., long. 20 W. on Aug. 15 (at which time an area of high pressure was central over Germany and extended S., over the Sahara), then it becomes plausible that this hurricane belongs to the class that is initiated by the flow of dry air from North African plateaus westward to the ocean (Monthly Weather Review, Aug. 1893). Author's note: According to Garriott (1900) a pressure as low as 28.70 inches was reported near lat. 22 N., long. 57 W. on Aug. 22. 2) The bark "T. Towner", which arrived in New York from St. Croix, fell in with a hurricane on Aug. 24 (The New York Times, Aug. 29, 1893, p.1, col.6). 3) The barque "Samuel", Cape Haytien to Le Havre, has arrived at Falmouth and reports having lost jibboom head, mainmast, three topmasts and her attached during a hurricane on Aug. 25 in lat. 23 29 N., long. 68 11 W. (The Times, London, Oct. 20, 1893, p.8, col.6). 4) The weather map of the morning of Aug. 25 showed indications of a hurricane center about 500 miles S.E. of Florida moving to the N.W.; subsequent reports indicated that the center was then far north of Turk Island, possibly near lat. 25 N., instead of being near that island as was at first thought (Monthly Weather Review, Aug. 1893). 5) Washington, Aug. 25, 8 P.M. There are indications of a storm center S.E. of Florida moving N.W. A heavy swell on the South Atlantic coast has been reported (The New York Times, Aug. 26, 1893, p.8, col.6). 6) A special bulletin issued at noon Aug. 26 indicated that early that morning the center of the hurricane passed to the N. of Bassau, where high winds prevailed all night and at 8 A.M. Aug. 26 the wind was brisk N.W., with the barometer at 29.56 inches (Monthly Weather Review, Aug. 1893). Author's note: The Nassau observation agrees with the Aug. 26 morning position about 100 miles N.E. of Nassau which was given by the Monthly Weather Review, Aug. 1893. 7) At 8 P.M. Aug. 26, the storm was central N.E. of Jupiter Inlet and, on the afternoon of Aug. 27, it had reached the Georgia coast, the storm carrying death and destruction in its path. 8) Washington, Aug. 26, 8 P.M. The hurricane center will probably strike the coast of the South Atlantic States on Sunday (Aug. 27), pass inward and break into general rains on Monday (The New York Times, Aug. 27, 1893, p.5, col.7). 9) Washington, Aug. 27, 8 P.M. Reports are missing from

Charleston to Key West but the hurricane that has been moving slowly northwestward off the Florida coast is now probably central near the coast of Georgia. It will move northward over Savannah, between Charleston and Augusta, to North Carolina. There are indications of its breaking up in that region Nonday afternoon, Aug. 28 (The New York Times, Aug. 28, 1893, p.5, col.7). 10) Savannah, Ga., Aug. 28. A terrible cyclone swept the coast late in the afternoon (Aug. 27), leaving death and destruction in its wake. Upward of 40 lives have been lost and millions of property destroyed. The full force of the storm struck Tybee Island. Thus far 16 persons are known to have died. The tug "Paulson" arrived in the city at 5 P.M. this afternoon (Aug. 28). She brought about 60 passengers from Tybee. The storm that has been predicted by the Weather Bureau for several days began early in the afternoon (Aug. 27) and continued until it reached its climax between 11 and 12, having blown for 8 hours a terrific hurricane. All the wharves along the river front are under water and the surrounding country presents a scene of wreck and ruin (The New York Times, Aug. 29, 1893, p.1, cols.4 and 5). 11) Philadelphia, Aug. 30. The entire Atlantic seaboard has been alarmed by the terrific cyclone which has travelled northward from the West Indies. The wind velocity yesterday was 47 mph here and 56 mph at New York. Fifteen bodies have been recovered at Savannah and 50 persons besides were missing. The hurricane there lasted 8 hours, reaching a velocity of 76 mph; the barometer fell to 28.31 inches and 30 vessels were wrecked (The Times, London, Aug. 31, 1893, p.3, col.1). 12) Selected observations taken at Savannah, Ga. indicate that the pressure dropped from 29.57 inches at 2 P.M. (E.S.T) Aug. 27 to 28.29 inches at midnight Aug. 27-28. then reaching a minimum of 28.28 inches at 12:35 A.M. Aug. 28 and going up to 28.30 inches at 1 A.M. and to 28.40 inches at 2 A.M. Aug. 28. After having experienced a wind maximum of 72 mph from the N.E. at 11:40 P.M. Aug. 27, winds below 20 mph were reported from 12:35 A.M. to 11:15 A.M. Aug. 28, with a minimum of 10 mph at this latter time. Winds reached a secondary maximum of 48 mph. from the S.W. at 2:30 A.M. Aug. 28. According to The Morning News (Savannah, Aug. 28, 1893), the storm ceased entirely shortly after midnight and for nearly an hour there was a period of entire calm, the moon rose and everything was as bright as day almost. A report the U.S. Army Corps of Engineers (1968) gives a high tide of 18.2 feet at Savannah Beach (Ho, 1989). Author's note: By using some hydrometeorological formulation, Ho (1989) estimated a central pressure about 27.50 inches when the storm made landfall on the Georgia coast. 13) Jacksonville, Fl., Aug. 29. The cyclone struck Jacksonville Sunday (Aug. 27) and rapidly increased in fury until 4 P.M. (The New York Times, Aug. 30, 1893, p.1, col.7). 14) According to a narrative of the weather encountered by the bark "Glencoyne" (which was previously in Storm 4, 1893), a heavy gale sprung out from the S. in the morning of Aug. 27 (The New York Times, Aug. 30, 1893, p.1, col.3). Author's note: The vessel appears to have been N. of Hatteras on that day and, therefore, the day or the gale direction, or both, are likely to be in error. 15) Charleston. The barque "Agnes" was blown ashore during the hurricane of Aug. 27-28 (The Times, London, Sept. 11, 1893, p.7,

col.6). 16) The shipwrecked crew of brig "Wanstrow" was brought to Southampton by the steamer "Spree". The brig left Liverpool for Wilmington on Jun. 23 and was caught in a hurricane on Aug. 27 and driven on Caswell Beach, North Carolina (The Times, London, Sept. 23, 1893, p.9, col.5). 17) Raleigh, N.C. Aug 28. The town of Kernville was struck by a terrific wind storm today. One hundred houses were blown down and 4 persons were killed (The New York Times, Aug. 29, 1893, p.1, col.5). 18) Washington, Aug. 28, 8 P.M. As far as can be judged from the few reports received, the barometer is lowest in southwestern Virginia, where the hurricane is now central. The hurricane center had passed over or very near Savannah, Augusta, Charlotte and Lynchburg (The New York Times, Aug. 29, 1893, p.3, col.7). 19) At 10 P.M. last night the storm was said to be central over western Virginia and moving northward at a very rapid rate, the lowest pressure at Lynchburg, where the barometer registered 29.34 inches (The New York Times, Aug. 29, 1893, p.1, col.6). 20) Augusta, Ga., Aug. 29. News was received from Port Royal, S.C. today that 100 lives were lost in the cyclone which burst over the town Monday (Aug. 28), followed by a tidal wave which almost swept the town away (The New York Times, Aug. 30, 1893, p.1, col.5). Author's note: The storm should have peaked at Port Royal very early in the morning of Aug. 28. 21) Fateful Charleston was subjected to the fury of a "tornado" Sunday night (Aug. 27-28) but not until today it was possible for the outside world to know of the damage done by wind and water. The "tornado" has left the city almost in ruin. Hundreds of trees lie uprooted across roadways, streets are strewn of debris from buildings and the sidewalks are filled with brick and mortar. The terrible floods of water which dashed angrily over the sea walls did their work effectively and the receding torrent, when it swept back to the sea, left a dismantled waterfront (The New York Times, Aug. 30, 1893, p.1, col.6). 22) Savannah, Ga., Aug. 30. Reports of Sunday's storm (Aug. 27) still continue to pour in. It is believed that the total loss of life is not less than 200. Information from persons that were at Beaufort and Port Royal state that the entire town of Beaufort has suffered untold loss, nearly all the wharf property being destroyed and many houses unroofed (The New York Times, Aug.31, 1893, p.1, col.1). 23) Augusta, Ga., Aug. 31. Further and more distressing news of the disastrous work of the hurricane at Port Royal was received tonight. The number of dead has been increased from 100 to 600 (The New York Times, Sept. 1, 1893, p.1, col.7). 24) According to a description given by Professor C. Abbe, the hurricane center might have gone near Savannah between 8 and 9 P.M. Sunday (Aug. 27). According to Abbe, the hurricane covered only 300 miles in radius Sunday. Augusta had 3 hours of calm and that showed that the storm center was passing over that place Sunday night and Monday, Aug. 28 (The New York Times, Aug. 30, 1893, p.2, col.5). 25) After killing thousands on the coast, the storm moved inland, passing through Charlotte before curving to the N.E. The massive size of this hurricane brought 72 mph winds to Wilmington, even though the more powerful winds remained near the storm's center, almost 150 miles inland (Barnes, 1995). 26) Harper's Weekly, Sept. 16, 1893 contains the following statements of interest: Savannah was severely hurt, but her distance from the

sea, the fact that is landlocked 18 miles up the river, resting upon a bluff 45 feet above the water level, gave her some immunity from the savages inflicted upon Charleston and Port Royal. Port Royal received the full shock of the storm. It was off Port Royal the "City of Savannah" was wrecked. The Government dry dock is a wreck. Phosphate works are dismantled and sea rolled over railroad tracks and piers. The ravage at Charleston was terrific. The loss of shipping off Tybee Island was greater than elsewhere because Savannah's shipping is larger than all southern ports combined. Hundreds of cropses were strewn along the farms,, unknown save of the vultures which flocked about them. Whole families are wiped out in some places. The coroner has sworn in an army of deputies and these are hunting for the dead (Garriott, 1900). 27) The map at 8 A.M. Aug. 29, 1893 was practically blank, as communication was cut off in all directions. But the subsequent reports show that the center was at that moment near Oswego, having moved at a remarkable rate of 450 miles in 12 hours and the elongated isobars suggest that within that interval a long trough of low pressure had been formed, stretching from Lynchburg to Oswego, and that isobars of 8 A.M. Aug. 29 represent the rapid filling up of the southern end of the trough and the transfer of the storm center from Lynchburg to Oswego rather than the movement of a well-defined center at a rapid rate over mountainous country. The 8 P.M. Aug. 29 map shows that the center was then a little E. of Quebec, and possibly within the border of Maine, having moved about 350 miles within 12 hours; the isobars now exhibit the great elongation characteristic of the breaking up of the storm (Monthly Weather Review, Aug. 1893). 28) The center reached the Canadian Maritime Provinces on Aug. 30 and passed to the N.E. of Newfoundland on Aug.31 (Monthly Weather Review, Aug. 1893). 29) Maximum wind velocities were as follows: Titusville, W. 55 mph on Aug. 27; Jacksonville, S.W. 48 mph on Aug. 27; Savannah, N.E. 72 mph on Aug. 27; Augusta, N.E. 52 mph on Aug. 28; Atlanta, N.W. 40 mph on Aug. 28; Charleston, E. 96 mph on Aug. 28; Wilmington, S.E. 49 mph on Aug. 28; Southport, S. 72 mph on Aug. 28; Charlotte, S.E. 42 mph on Aug. 28; Norfolk, S.E. 45 mph on Aug. 28; Lynchburg, S.E. 30 mph on Aug. 28; Washington, D.C., S.E. 42 mph on Aug. 29; Baltimore, S.E. 42 mph on Aug. 29; Harrisburg, W. 40 mph on Aug. 29; New York, S.E. 54 mph on Aug. 29; Albany, S.E. 44 mph on Aug. 29; New London, 57 mph on Aug. 29; New Haven, S. 57 mph on Aug.29; Boston, S. 48 mph on Aug. 29; Northfield, W. 33 mph on Aug. 29; Manchester, S.E. 31 mph on Aug. 29; Portland, S.E. 40 mph on Aug. 29 (Monthly Weather Review, Aug. 1893). 30) Hurricane of Aug. 27-29, 1893. Minimal on the N.E. coast of Florida. Extreme in Georgia and the Carolinas, 1000 to 2000 killed. Minor on the Middle Atlantic coast and also in the western sections of New England (Dunn and Miller, 1960). 31) Storm of Aug. 22-30, 1893. Disastrous on coast of Georgia and South Carolina. Reached Charleston and Savannah on Aug. 27. "Accompanied by a tremendous wave which submerged islands". Property damage of 10 million dollars. 1000 lives lost. Ravage at Charleston is said to be terrific (Tannehill, 1938). 32) Track for the storm showing the following morning positions: Aug. 22, lat. 22 N., long. 57 W.; Aug. 23, lat. 22.7 N., long. 62.5 W.; Aug. 24, lat. 23.5 N., long. 67.5 W.; Aug. 25, lat. 24.3 N., long. 72 W.; Aug. 26, lat. 25.5 N.,